

## ABSTRACT OF THE DISCLOSURE

An ultrasonic imaging system includes an ultrasonic transducer having an image data array and a tracking array at each end of the image data array. The tracking arrays are oriented transversely to the image data array. Images from the image data array are used to reconstruct a three-dimensional representation of the target. The relative movement between respective frames of the image data is automatically estimated by a motion estimator, based on frames of data from the tracking arrays. As the transducer is rotated about the azimuthal axis of the image data array, features of the target remain within the image planes of the tracking arrays. Movements of these features in the image planes of the tracking arrays are used to estimate motion as required for the three-dimensional reconstruction. Similar techniques estimate motion within the plane of an image to create an extended field of view.

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